REMARKS

Claims 1-27 and 36-41 are now pending. Claims 28-35 were cancelled previously without prejudice or disclaimer of subject matter. Claims 1, 16, 22, 36, and 37 are independent claims.

Claims 1-8, 22-25 and 36-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,973,444 (*Xu et al.*) in view of U.S. Patent No. 6,628,053 (*Den et al.*). Claims 9, 10, 13-15, 26, 27, 40 and 41 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,847,495 (*Yamanobe et al.*) in view of *Xu et al.* and further in view of *Den et al.*[1] Claims 11, 12, and 16-21 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Yamanobe et al.* in view of *Xu et al.*, *Den et al.*, and U.S. Patent No. 5,066,883 (*Yoshioka et al.*).

The rejection of independent Claims 1, 22, 36 and 37 over *Xu et al.* and *Den et al.* will first be addressed.

Claim 1 is directed to an electron-emitting device comprising (A) fiber and (B) a layer including a metal-oxide semiconductor. The fiber is comprised of carbon as a main ingredient. The layer including a metal-oxide semiconductor has the metal-oxide thereof selected from the group consisting of titanium oxide, zirconium oxide, and niobium oxide. Furthermore, the fiber is disposed on the layer and partially contains Pd.

1/ Yamanobe et al. is cited as the primary reference in this rejection; even though the rejection involves only dependent claims, and the base claims from which those dependent claims depend were not rejected at all based on Yamanobe et al. Accordingly, it is believed that the rejection is improper.

Xu et al. relates to carbon fiber-based field emission devices and discloses that carbon fiber emitters for field emission devices are catalytically grown onto a selected area of a device surface. An insulating layer, such as silica or alumina, is used as a catalyst support material (see column 7, lines 52-58). *Xu et al.* also discloses that fibers can contain portions of the catalyst; for example, a fiber may contain at least one transition metal or a compound or alloy thereof. Additionally, *Xu et al.* discloses that the transition metal may be Fe, Co, Ni, Cr, Mn, Mo, W, Re, Ru, Os, Rh, Ir, Pd, Pt, Zn, or Cu (see col. 9, lines 25-39).

Page 3 of the Office Action concedes that "Xu does not appear to specify the use of Ti as the component of the oxide semiconductor growth surface...." Nonetheless, the Office Action then asserts that "Den in the same field of endeavor discloses the use of Titanium and Titanium Oxide as a growth structure for a carbon nanotubes[, and] discloses the use of a titanium conductor (21) and titanium oxide (35) formed through oxidation on the titanium conductor. (See figure 6A). The titanium oxide is stated as a conductor however its width and method of formation allow it to be partially conductive. (Column 8 lines 5-33)."

However, Applicant respectfully disagrees with the foregoing assertion. At col. 8, lines 18-33, *Den et al.* teaches with respect to a description of Figs. 6A to 6D, that:

> " All these embodiments, indicate a tunnel junction, and the optimum insulating layer thickness depends upon the driving voltage, the composition and structure of <u>the insulating layer 35</u>. The thickness of the insulating layer 35 should preferably be within a range of from a sub-nm to several tens of nm, or more specifically, from 1 to 10 nm. The composition of <u>the insulating layer 35</u> <u>may comprise</u>, for example, silicon oxide, <u>titanium</u>

oxide, or alumina. The insulating layer 35 may be formed, prior to forming the wall 22 on the conductive surface 21, by oxidizing the conductive surface 21, in the case of FIG. 6A. In the case of the configurations shown in FIGS. 6B and 6C, it may be formed, after forming the wall 22, by oxidizing the wall 22 and the conductive surface 21 or the conductive surface 21 alone." (Emphasis added)

In view of the foregoing cited passage, it is clear that *Den et al.* element 35, which the Office Action states is a titanium oxide conductor that is partially conductive, is instead a non-conductive insulating layer. The applicable passage of *Den et al.* does *not* teach or suggest that the titanium oxide is a conductor having a width and method of formation allowing it to be partially conductive, as asserted in the Office Action. Indeed, nothing in *Den et al.* would teach or suggest a layer including a *metal-oxide semiconductor*, wherein the metal-oxide thereof is selected from the group consisting of titanium oxide, zirconium oxide, and niobium oxide, as recited in Claim 1 (emphasis added).[2]

Accordingly, even if *Xu et al.* and *Den et al.* were to be combined in the manner proposed in the Office Action (which, in any event, is not admitted as being obvious or technically feasible), the resulting combination would result merely in the insulating layer 35 of *Den et al.* being incorporated into the *Xu et al.* device, and would not teach or suggest at least the above-emphasized features of Claim 1. Accordingly, Claim 1 is believed to be clearly patentable over those references, whether considered separately or in combination.

2/ Support for these features appears in the specification as originally filed, at least from page 27, line 25 to page 28, line 7, and page 28, and lines 23-26.

Independent Claims 22, 36, and 37 recite features that are substantially similar in many respects to those of Claim 1 emphasized above, and also are believed to be clearly patentable over *Xu et al.* and *Den et al.*, whether considered separately or in combination, for essentially the same reasons as those set forth above. Accordingly, withdrawal of the rejection of Claims 1, 22, 36, and 37 is respectfully requested.

The rejection of Claim 16 over *Yamanobe et al.* in view of *Xu et al.*, *Den et al.*, and *Yoshioka et al.* will now be addressed.

Claim 16 recites, in part, a layer including a metal-oxide semiconductor, wherein the metal oxide thereof is selected from the group consisting of titanium oxide, zirconium oxide, and niobium oxide.

The Office Action cites *Yamanobe et al.* for disclosing the use of a step portion 21 under the first electrode to raise the electrode higher than the second electrode, and cites *Yoshioka et al.* for disclosing the use of directly etching the substrate in order to create a step portion and raise the first electrode. However, it is respectfully submitted that nothing in either reference would teach or suggest the above-recited features of Claim 16.

Furthermore, for the reasons set forth above, neither Xu et al. nor *Den et al.* teaches or suggests those features of Claim 16. Accordingly, Claim 16 is deemed clearly patentable over *Yamanobe et al.*, *Xu et al.*, *Den et al.*, and *Yoshioka et al.*, whether considered separately or in combination. As such, withdrawal of the rejection of Claim 16 is respectfully requested.

A review of the other art of record, including *Yamanobe et al.* and *Yoshioka et al.*, has not revealed anything which, in Applicant's view, would remedy the deficiencies of art addressed herein, against the independent claims. Accordingly, those claims are believed to be patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing, favorable reconsideration and early passage to issue are respectfully requested.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100 or by facsimile at (212) 218-2200. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

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